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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,275	12/23/2003	Vaidyanathan Balasubramaniam	071469-0306881	4465

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EXAMINER	
NGUYEN, THANH T	

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/743,275	BALASUBRAMANIAM ET AL.	
	Examiner	Art Unit	
	Thanh T. Nguyen	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *25-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-14 and 16-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

This application contains claims 25-33 drawn to an invention nonelected with traverse in Paper No. 6/30/05. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Response to Arguments

Applicant's arguments with respect to claims 1, 3-14, 16-24 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-9, 11-12, 14, 16-18, 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (U.S. Patent Publication No. 20050079710) in view of Suzuki (U.S. Patent Publication No. 2001/0048981).

Referring to figures 2-5J, Zhu teaches a method for removing photoresist from a substrate comprising:

disposing said substrate in a plasma processing system (100), said substrate having a dielectric layer (OSG/cap) formed thereon with said photoresist (PR) overlying said dielectric Layer (OSG/cap), wherein said photoresist provides a mask for etching a feature into said dielectric Layer (see figures 2-5j),

introducing a process gas comprising N_xO_y, wherein x and y are integers greater than or equal to unity (see figures 2, paragraph# 25+);

forming a plasma from said process gas in said plasma processing system (206, see figures 2, paragraph# 25+); and

removing said photoresist from said substrate with said plasma (208, see figures 2, paragraph# 29+);.

Regarding to claims 3, 16. introducing of said process gas further comprises introducing an inert gas (see paragraph# 25).

Regarding to claims 4, 17, introducing of said inert gas comprises introducing a Noble gas (see paragraph# 25).

Regarding to claims 5. disposing of said substrate having said dielectric Layer comprises disposing said substrate having a low dielectric constant dielectric Layer (see paragraph# 23).

Regarding to claims 6. disposing of said substrate having said dielectric Layer comprises disposing said substrate having at Least one of a porous dielectric Layer, and a non-porous dielectric Layer (see paragraph# 23).

Regarding to claims 7. disposing of said substrate having said dielectric Layer comprises disposing said substrate having said dielectric Layer including at Least one of an organic material, and an inorganic material(see paragraph# 23).

Regarding to claims 8. disposing of said substrate having said dielectric Layer comprises disposing said substrate having said dielectric Layer including an inorganic-organic hybrid material(see paragraph# 23).

Regarding to claims 9. disposing of said substrate having said dielectric layer comprises disposing said substrate having said dielectric layer including an oxidized organo silane (see paragraph# 23).

Regarding to claims 11. disposing of said substrate having said dielectric Layer comprises disposing said substrate having said dielectric Layer including a silicate-based material(see paragraph# 23).

Regarding to claims 12. disposing of said substrate having said dielectric Layer comprises disposing said substrate having said dielectric Layer including a collective film including silicon, carbon, and oxygen(see paragraph# 23).

Regarding to claims 14. A method of forming a feature in a dielectric layer on a substrate comprising:

forming said dielectric Layer (OSG)on said substrate,

forming a photoresist pattern (PR) on said dielectric Layer;

transferring said photoresist pattern to said dielectric Layer by etching (see fig. 3a+), and

removing said photoresist from said dielectric Layer using a plasma formed with a process gas comprising N_xO_y, wherein x and y are integers greater than or equal to unity (see fig. 2+, paragraph# 25).

Regarding to claims 18. removing of said photoresist is performed for a first period of time (see paragraph# 2+).

Regarding to claims 23. transferring of said photoresist pattern to said dielectric layer by etching is performed in a plasma processing system, and said removing of said photoresist from said dielectric Layer is performed in said plasma processing system(100, see paragraph# 25+, figures 2+).

Regarding to claims 24. transferring of said photoresist pattern to said dielectric layer by etching is performed in a plasma processing system, and said removing of said photoresist from said dielectric Layer is performed in another plasma processing system (see figures 2+, paragraph# 25+).

However, the reference does not teach introducing a process gas comprising at least one of NO or NO_2 to remove the photoresist.

Suzuki teaches introducing the process gas comprising at least one of NO or NO_2 then plasmazing the gas to remove the photoresist (see paragraph# 44).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would removing the photoresist by using plasma gas of NO or NO_2 in process of Zhu et al. as taught by Suzuki because the process is known in the art to remove the photoresist or any residue that left on the surface of the substrate.

Claims 10, 13, 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (U.S. Patent Publication No. 20050079710) in view of Suzuki (U.S. Patent Publication No. 2001/0048981) as applied to claims 1, 3-9, 11-12, 14, 16-18, 23-24, further in view of Mukherjee-Roy et al. (U.S. Patent Publication No. 2003/0216026) and Bao et a. (U.S. Patent Publication No. 2005/0130411).

Zhu et al. in view of Suzuki teaches a method of stripping photoresist film on the organosilicate glass dielectric layer. However, the reference does not teach the dielectric Layer including at Least one of hydrogen silsesquioxane, and methyl silsesquioxane, disposing hydrogen in collective film, removing of photoresist determined by endpoint detection comprises utilizing optical emission spectroscopy.

Mukherjee-Roy et al. teaches a method of forming an opening in the dielectric layer wherein the dielectric Layer including at Least one of hydrogen silsesquioxane, and methyl silsesquioxane, disposing hydrogen in collective film (see paragraph# 25, and claim 5).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form dielectric Layer including at Least one of hydrogen silsesquioxane, and methyl silsesquioxane, disposing hydrogen in collective film in process of Zhu et al. as taught by Mukherjee-Roy et al. because the low dielectric constants to prevent problems with capacitance, cross talk, between adjacent conducting layers and elements.

Bao et al. teaches removing of photoresist determined by endpoint detection comprises utilizing optical emission spectroscopy (see paragraphs# 45, 54).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made to removing the layer determined by endpoint detection

comprises utilizing optical emission spectroscopy in process of Zhu et al. as taught by Bao et al. because the process would sense when the removing process complete to terminate the flow of the plasma gas.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (571) 272-1695, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, can be reached on (571) 272-1702. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (**See MPEP 203.08**).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to thy Private PAIR system, contact the Electronic Business center (EBC) at 866-217-9197 (toll-free).

Thanh Nguyen
Patent Examiner
Patent Examining Group 2800

TTN